ECONOMIC MODEL OF INVESTMENT ACTIVITY IN UZBEKISTAN AND PERSPECTIVE REFORMS FOR THE FUTURE

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Abstract. *Ensuring investment activity is directly linked to a number of economic factors. An econometric model must be developed to calculate that link accurately. In this case, the extent to which the factors affecting should be determined. The article examines the econometric models and factors affecting the growth of foreign investment.*

Key words: *Multiple linear regression model, The amount of foreign investments, Gross Domestic Product growth, Export of goods and services, Strength of investor protection index, Registering property cost, Required time to start a business.*

ЭКОНОМИЧЕСКАЯ МОДЕЛЬ ИНВЕСТИЦИОННОЙ ДЕЯТЕЛЬНОСТИ В УЗБЕКИСТАНЕ И ПЕРСПЕКТИВНЫЕ РЕФОРМЫ НА БУДУЩЕЕ

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Аннотация. *Обеспечение инвестиционной деятельности напрямую связано с рядом экономических факторов. Для точного расчета этой связи должна быть разработана эконометрическая модель. В этом случае должна быть определена степень влияния факторов. В статье рассматриваются эконометрические модели и факторы, влияющие на рост иностранных инвестиций.*

Ключевые слова: *Модель множественной линейной регрессии, Объем иностранных инвестиций, Рост валового внутреннего продукта, Экспорт товаров и услуг, Индекс силы защиты инвесторов, Регистрация стоимости недвижимости, Необходимое время для начала бизнеса.*

O'ZBEKISTONDA INVESTITSION FAOLIYATNING IQTISODIY MODELLARI VA KELAJAKDAGI ISTIQBOLLI ISLOHOTLAR

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Annotatsiya. *Investitsion faollikni ta'minlash bir qator iqtisodiy omillar bilan bevosita bog'liqdir. Bu bog'liqlikni aniq hisoblab chiqish uchun ekonometrik model tuzish lozim. Bunda ta'sir etuvchi omillarning qay darajada bog'liqlik darajasi aniqlanishi kerak. Maqolada ekonometrik model tuzilgan va xorijiy investitsiyalar hajmini oshishiga ta'sir etuvchi omillar o'rganilgan.*

Kalit so'zlar: *Ko'p chiziqli regression modellar, xorijiy investitsiyalar miqdori, yalpi ichki mahsulotning o'sishi, tovarlar va xizmatlar eksporti, investorlarni himoya qilish indeksining mustahkamligi, mol-mulkni ro'yxatdan o'tkazish, biznesni boshlash uchun zarur vaqt.*

In the economic literature, there exist several approaches, which attempt to model investment behavior. A survey study aimed at presenting the current situation on investment decisions in a country like Uzbekistan becomes increasingly perceptible.

The following model examines the determinants of investment activity in Uzbekistan. There is constructed a multiple linear regression model and test for the factors that presumable influence this investment activity in the country based on theoretical as well as on empirical evidence. The model will help to make some comments concerning the encouragement of investment activity in Uzbekistan. The purpose of the model is to identify the significance of specific factors in explaining the investment activity in Uzbekistan.

The amount of foreign investments (Y)-is the dependent predictor. In case of Uzbekistan, this dependent factor is the amount of total foreign investments.

Gross Domestic Product growth (X1)-demand as expressed through GDP is considered to be a major determinant of investment activity as many foreign investors firstly take into account the macroeconomic growth rate. A careful examination of the data, mainly for Singapore's Economy presented by Bakoyev (2016) [1] demonstrated that output has, indeed, been one of the main determinants of investment. Thus, the amount of foreign investment closely follows the increasing trend of GDP in Uzbekistan. The annual GDP growth for the last 3 years has been more than 5-6% while the flow of foreign investments for these years has increased by about 3%. Consequently, it is reasonable to assume that an increasing level of output influences positively the level of investment expenditure in the country.

Export of goods and services (X2). Another important determinant of investment activity seems to be export. If firms expect to face a high level of profits from export of products, the decision to undertake an investment will be positively influenced. It is also obvious that if there are difficulties for trade in the economy, the effect on future foreign investment could be negative. In other words, "firms with more opportunities for export invest more" (Romer, 1996, p.381) [2] and, so we expect a positive relationship between the size of investment and the growth of export.

Strength of investor protection index (X3). It is one of the indicators of *Doing Business*, which ranges from 0 to 10. Protecting investors' matters for the ability of companies to raise the capital they need to grow, innovate, diversify and compete. If the laws do not protect minority shareholders, investors may be reluctant to provide funding to companies through the purchase of shares unless they become the controlling shareholders. The higher the Strength of investor protection index, the higher the level of investment.

Registering property cost (% of property value) (X4). *Doing Business* records the full sequence of procedures necessary for a business to purchase property from another business and transfer the property title to the buyer's name. The transaction is considered complete when it is opposable to third parties and when the buyer can use the property, use it as collateral for a bank loan or resell it. The ranking on the ease of registering property is the simple average of the percentile rankings on its component indicators: procedures, time and cost. Registering property cost is the cost required to complete each procedure of registration and it is measured as the percentage of property value.

Required time to start a business (days) (X5). It is one of the indicators of *Doing Business*, which can affect to investment quantity. Formal registration of companies has many immediate benefits for the companies and for business owners and employees. Formally, registered companies have access to services and institutions from courts to banks as well as to new markets. Where governments make registration easy, more entrepreneurs start businesses in the formal sector, creating more good jobs and generating more revenue for the government. [3] The more the amount of the days may result the less amount of investments.

According to the above suppositions, the equation for investment in processing is written in linear form as follows:

$$Y = a_0 + a_1X1 + a_2X2 + a_3X3 + a_4X4 + a_5X5 \qquad (1)$$

Where X1, X2, X3, X4, and X5 are predictors, which influence to Y and a_0, a_1, a_2, a_3, a_4, a5 are regression coefficients.

Table 1

Gathered statistics for the economic model. Uzbekistan

Years	The amount of Foreign investments(USD mln)(Y)	GDP growth(in %) (X1)	Export of goods and services(USD mln) (X2)	Strength of investor protection index (0-10) (X3)	Registering property cost (% of property value) (X4)	Required time to start a business (days) (X5)
2006	448	103,8	2513,5	2	7,2	27
2007	602	104,3	3190,1	3	8,5	35
2008	755	105,8	4279,4	3	6,8	29
2009	748	107	5409,3	3	4,5	30
2010	896	107,3	6425,3	4	3,8	31
2011	1286	107,5	8991,5	4	2,1	32
2012	1882	107,8	9324,1	4	2,2	15
2013	2942	108,1	1125,5	4	2,5	16
2014	3284	108,5	13023,4	4	2,6	16
2015	3248	107,9	15021,2	4	2	14
2016	3578	106,2	12178.7	4	1	11
2017	3348	105,2	13953.8	4	1	9

Sources: Doing Business 2017 and http://www.uzinfoinvest.uz [4]

Now with the help of 12 years' statistics we will analyze factors which influence on the investment activity in Uzbekistan. The "Data Analysis" function of EXCEL program shows us the following figures.

Table 2

The correlations matrix of the predictors

	Y	X1	X2	X3	X4	X5
Y	1					
X1	0,7745	1				
X2	0,7631	0,6736	1			
X3	0,4919	0,7074	0,6148	1		
X4	-0,8028	-0,9329	-0,7337	-0,8478	1	
X5	-0,9183	-0,6792	-0,6751	-0,5462	0,7509	1

The results confirm the anticipated positive relationship between investment and GDP growth, the amount of export, Strength of investor protection index (Doing

Business) and the anticipated negative relationship between investment and Registering property cost, required time to start a business.

Here $r_{ij} \leq \min(r_{1i}; r_{1j})$ $i, j \neq 1$ so, there is multicollenearity between X1 and X4 and there is low correlation between Y and X3. We must check up VIF analysis. After the VIF analysis, we determine that there is multicollenearity between the prediction X1 and X4. Because VIF=12, 01>9,2. We can put away the prediction X1 (GDP growth (%)) from the model.

We can also put away the prediction X3 (Strength of investor protection index (0-10)), because it correlated low with Y (The amount of Foreign investments). We can see from the *Doing Business* statistics that the index of strength of investor protection equaled to 4 in 2015 and it hasn't changed for the last 3 years, but the amount of inflow of foreign investments to Uzbekistan has increased more than four times during these 8 years (748mln USD in 2010, 3348 mln USD in 2017) [5]. These facts show that investors have made decisions neglecting Strength of investor protection index.

Table 3

The regression coefficients of the predictors

Predictors	R^2	Models
Yand X2	0,5823	y=315,85+0,206*X2
Yand X4	0,6445	Y=3631,8-439,9*X4
Yand X5	0,8432	y=5017,5-136,1*X5
Yand X2,X4,X5	0,8893	**Y = 4072,5 + 0,05X2 − 86,02X4-98.9X5**

With regard to the factors determining investments in processing, according to the regression coefficients, it seems that the Registering property cost(X4) is the most important factor in determining investments as $R^2 = 0,8432$. The above three factors including X2 (Export of goods and services), Registering property cost(X4) and required time to start a business (X5) can explain Y by 88.93%.

The equation for investment in processing is written in linear form as follows:

$Y = a_0 + a_2X2 + a_4X4 + a_5X5$ (2) Where: $a_0 > 0$, $a_2 > 0$, $a_4 < 0$, $a_5 < 0$

Table 4

The amount of coefficients:

$a_0=$	4072,45
$a_2=$	0,053421
$a_4=$	-86,0246
$a_5=$	--98,8646

And the linear model of multiple regression is $Y = 4072,5 + 0,05X2 – 86,02X4-98.9X5$. Before accepting as the best model, we should check it for F-test and T-test.

F-test. The test checks whether the equation explains the significant part of dependent predictor(Y).$F > F_{0.05}$ (1, 10)-(21, 42>4, 96) from this exponent H0 is rejected. Thus these predictors (X2, X4 and X5) explain a significant percentage of (differ from 0) the changing of Y (The amount of foreign investment) in the last linear of multiple regression ($Y = 4072,5 + 0,05X2 – 86,02X4-98.9X5$).

T-Test. The test checks whether the each predictor in the equation explains the significant part of dependent predictor (Y).

$t_{a/2}(n-k)=2,75 t(X2)=2.802$ $t(X4)=-2.915$ $t(X5)=-3,598$

For the predictors X2, X4 and X5 H_o is rejected, because $| t |>ta/2(n-k)$ and they can explain the significant portion of Y. We can say with confident 95 % that X2(Export of goods and services), X4(Registering property cost) and X5 (Required time to start a business) variables can explain a significant portion of (differ from 0) Y (The amount of foreign investments) during the years 2006-2017.

Below, after the some stages we make up the linear of multiple regression:

$Y = 4072,5 + 0,05X2 – 86,02X4-98.9X5$.

We can conclude from the model that, if the government reduce the time by 1 unit (in our case it is in days), the amount of foreign investments may increase by \$98.9 mln., making the process of property registration easier can bring more FDI: If the property cost is decreased by 1%, the amount of foreign investments may increase by \$86, 02 mln. Encouraging foreign trade can helps to catch the attention of more investors and in our model, export increase by 1 unit (USD mln) can bring further \$0.05mln foreign capital.

In general, we can conclude that, the necessity of making the registration process easier and of utilizing the experience of foreign entrepreneurs, as well as measures undertaken to improve the investment climate in Uzbekistan can facilitate a dynamic change in the structure of foreign investment in the total volume of capital investments. There has been an activation of foreign direct investment inflow and in 2018 this share amounted to more than 75% [6] of the total volume of foreign investment, which exceeded 3.1 billion USD. And by applying the abovementioned suggestions, the inflow of FDI can increase to higher amount.

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